

### **ARGUMENTS and REMARKS**

Applicant thanks the Examiner for the current review of this case and for the prompt granting of several telephone communications with applicant's attorney to date. Claims 1 through 27 are in the current case. Claims 10 through 27 have been withdrawn pursuant to an earlier Restriction Requirement. Claims 1 through 9 remain in consideration and no claims have yet been allowed.

### **DRAWINGS**

The Examiner has required the submission of new drawings under 37 CFR 1.121(d) to update the included language to English from the original German language of the international priority application. Applicant has accordingly amended the application with English language replacement sheets 1 through 3 provided herewith. FIG. 2 has also been updated to include structure element number 26 which is discussed in the specification as "resembling a printed circuit board" where the energy receiver (12), voltage sensitive switch (14), and transmitter (18) are located. See Preliminary Amendment at p. 20, lines 10-13.

### **CLAIM REJECTIONS - 35 U.S.C. § 112**

The Examiner has rejected claims 1 through 9 under 35 U.S.C. § 112, first paragraph, the Examiner contending the claims do not comply with the enablement requirement, the Examiner indicating enablement concerns from the specification regarding the use of the term "identity" in independent claim 1.

Applicant notes that the current specification, as supported by the international priority document and as modified by the preliminary amendment filed January 15, 2007, reflects the requirement of claim 1 that "The identity of the control information receiver and the magnitude of the influence on the electrical bioactivity are coded in analog fashion by at least one of the frequency and/or amplitude of the control information signals." See Preliminary Amendment at p. 13, lines 2-4.

The specification further provides specific examples of such analog coding, including information relating to the transmitter identity, disclosed as including analog coding of "the time profile of the voltage difference to be coded and/or imaged into a change in, for example, the transmit amplitude, transmit wavelength, transmit frequency, or alternatively, in the shape and level of individual pulses." See Preliminary Amendment at p. 13, lines 8-13. The specification also provides examples of operable properties of individual apparatuses of the invention, in the context of both measuring and identity functions, that allow individual devices to be distinguished.

For example, the switch is described as being capable of being configured to switch the transmitter on or off when detected voltage is above or below a voltage threshold value *that can be fixed in advance* for the individual apparatus. See Preliminary Amendment at p. 14, lines 7-12. Individual transmitters can also be distinguished according to different transmission properties, "e.g. transmit amplitude and/or transmit frequency," and this feature can also be extended to distinguish two or more separate transmitters of the same apparatus. See Preliminary Amendment at p. 14, lines 20-22. Applicant notes that this characteristic of the invention is described in the specification in the context of (1) achieving "an even higher density of the [multiple] devices in a tissue"; and (2) "to achieve a unique identification of the transmitters

without a large outlay on components and signal processing." See Preliminary Amendment at p. 14, line 22-p.15, line 2. Applicant therefore submits that the current specification provides sufficient enabling support, well within the level of basic understanding required by one skilled in the applicable art, to allow for the determination of apparatus identity, as both generally and specifically described in the application.

Following the receipt of the current Office Action, telephone interviews were held between the Examiner and applicant's attorney, notably on October 25 & 26, 2010. During these interviews, the Examiner and applicant's attorney agreed to several claim revisions to place the application into a better condition for allowance and to address the current § 112, § 102, and § 103 rejections. The resulting revisions are reflected in the current Listing of Claims above. Applicant refers to these revisions in further response to the current enablement rejection as discussed with the Examiner.

The Examiner has rejected claims 1 through 9 under 35 U.S.C. § 112, second paragraph, for being narrative and for indefiniteness, citing specifically the inclusion of "for" and "can be" language, and noting apparent literal translation from the foreign priority document as a source of grammatical and idiomatic errors. Applicant submits the claims have now been revised to address each of the Examiner's concerns following and as addressed during the above-noted phone interviews. Applicant further submits the claims are now, as currently amended, also consistent with the earlier Preliminary Amendment and are therefore in an appropriate format for U.S. allowance.

**CLAIM REJECTIONS - 35 U.S.C. § 102**

The Examiner has rejected claims 1-3 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 3,662,758 to Glover ("Glover"), the Examiner contending Glover discloses a device for detecting a voltage difference representing bioactivity of living tissue, the voltage difference detected by two measuring electrodes. The Examiner further contends Glover discloses a wireless transmitter ("33, FIG. 2") to transmit information outside the tissue, a wireless energy receiver ("30, FIG. 2") for receiving energy from outside the tissue to supply the transmitter with electrical energy, the transmitter and energy receiver operating parallel in time, a voltage sensitive switch ("32, FIG. 2") connected between the electrodes and transmitter such that information relating to bioactivity can be coded in analog fashion in the form of a change of at least one transmission property of the transmitter, and information relating to transmitter identity being similarly coded.

Applicant respectfully submits that a major distinction between Glover and the current application is reflected by the fact that the current application claims a device which detects voltage in tissue rather than impedance. Applicant notes that Glover discloses a system incorporating a free-running multi-vibrator (52) controlled by the impedance of tissue between the disclosed electrodes (46a) and (46b). See Glover at col. 5, line 11. However, the Glover disclosure lacks an arrangement for voltage measurement and describes no means for performing such measurement.

Applicant submits that this distinction also leads to a significant teaching by Glover away from the current invention. Although applicant's invention can be used in various types of living tissue, it is notable that the invention can also be specifically used in living brain tissue. It

is further notable that the current application's disclosed measurement of voltage development over time further lends the current invention to use in brain tissue.

In comparison, for purposes of measuring impedance, the Glover implant injects a low level signal into the tissue. See Glover at col. 4, lines 72-75. Such signal injection would be suitable for use in certain organ tissues such as that of the human bladder, but would be extremely hazardous for use in living brain tissue as it could lead to extremely adverse effects on brain function. The Examiner is therefore invited to consider that while the device of the current invention, as claimed, is not restricted to use in any one particular type of living tissue, such differences in possible implementation represent major fundamental differences between the disclosed impedance measurement of Glover and the claimed voltage measuring aspect of the current invention.

Applicant further respectfully submits that a further distinction between Glover and the current invention is reflected in the current invention's utilization of a voltage sensitive switch connected between electrodes to influence the transmitter and relate changes in bioactivity voltage. The Glover specification explains that Glover's disclosed controller means (32) is to be understood as a clock controlled time series replay device. See Glover at col.4, lines 16-66 and at Fig. 3. The Glover multi-vibrator (50) provides a clock that forces the controller (32) to play through a hard-coded stimulation program, which for example is provided by the 4-bit shift register and interaction with the internal silicon controlled rectifier. It follows that the hard-coded stimulation program can only be externally controlled by switching the external power supply on and off.

Electrical energy is induced by the Glover apparatus into the tissue by electrodes (46a), (46b), and (46c). The Glover controller (32) works without feedback from the electric activity of

the tissue and it has no control over the disclosed transmitter (33). Applicant observes and concedes that, in at least some contexts, the 4-bit shift in Fig. 2 of Glover could be understood as a type of voltage sensitive switch. However, applicant further observes that the 4-bit shift (a) is not connected to electrodes for measuring; and (b) does not control the transmitter in any way. It therefore follows that Glover's control means and other system components lack a voltage sensitive switch or like component that is connected between two measuring electrodes where the voltage sensitive switch influences the transmitter such that information relating to the changes on electrical bioactivity can be coded in the form of at least one transmission property change.

Applicant acknowledges that many of the above-noted distinctions were earlier discussed with the Examiner during the October 25 & 26, 2010 telephone interviews with applicant's attorney to address many of the Examiner's current bases of rejection. Thus, applicant further refers to the current claim amendments in the above Listing of Claims in further response to the current § 102-based rejections.

The Examiner has further rejected claim 2 under § 102(b) over Glover, contending "Glover discloses a device further wherein at least one transmission property of said transmitter is a transmit frequency." Although it is conceded that Glover discloses FM transmission of information, applicant submits that Glover omits any disclosure related to the transmission of information by modulation of amplitude. However, regardless of the Examiner's final finding on this point, applicant submits claim 2 should be considered allowable due to its dependence on claim 1 which applicant believes is allowable in its currently amended form.

The Examiner has also rejected claim 3 under § 102(b) over Glover, contending Glover

switches its transmitter to an on or off condition when the voltage difference overshoots or undershoots a predetermined voltage threshold value. In view of this rejection, applicant observes that neither Glover's transmitting means (33)/FIG. 2 nor any portion of the Glover disclosure suggest non-linear components concerned with the transmission and/or computation of measured information. All of the disclosed components in Glover's transmitting means are only capable of smooth functional behavior. Such components do not allow for the comparison of a measured value with a given threshold and therefore produce two different behavioral states regardless of whether the value lies above or below the threshold. The behavior suggested by the Examiner would require non-linear components which are not suggested by Glover. However, regardless of the Examiner's final finding on this point, applicant submits claim 3 should also be considered allowable due to its dependence on claim 1 which applicant believes is allowable in its currently amended form.

#### **CLAIM REJECTIONS - 35 U.S.C. § 103**

The Examiner has rejected claims 4-8 under 35 U.S.C. § 103(a) over Glover, concluding Glover discloses all claimed elements "except wherein said transmitter comprises a closed resonant circuit, a photodiode, an LED, a quantum well structure, or a quantum line structure," the Examiner taking Official Notice such transmission means are well known. The Examiner cites U.S. Patent No. 4,541,431 to Ibrahim et al. as an example of a closed resonant circuit transmission means, U.S. Patent No. 4,677,982 to LLinas et al. as an example of a photodiode transmission means, U.S. Patent No. 4,495,384 to Scott et al. as an example of an LED transmission means, U.S. Patent No. 6,248,069 to Liu et al. as an example of a quantum well structure transmission means, and U.S. Publication No. 2002/0186727 to Aoki as an

example of a quantum line structure transmission means, concluding it would have been obvious to use any of such transmission means to transmit signal data in the Glover device.

Applicant does not dispute that closed resonant circuits, photodiodes, LEDs, quantum well structures, and quantum line structures are all well known in the prior art. Nevertheless, applicant is unable to find support in any of the references suggesting the disclosed devices would, as presented in the references, lend themselves to the type of tissue implantation application that is the subject of the current invention. Applicant believes this is especially true when considered in the context that applicant's invention, as disclosed, would be appropriate for use in brain tissue.

Applicant notes that the existence of such prior art apparatuses was among the items discussed with the Examiner during the October 25 & 26, 2010 telephone interviews with applicant's attorney. Given that each of claims 4-8 are dependent on claim 1, and since claim 1 itself is not currently under a § 103(a) rejection, applicant further refers to the current amendments to claim 1 in the above Listing of Claims in further response to the current § 103 rejections of claim 4-8.

The Examiner has rejected claim 9 under 35 U.S.C. § 103 (a) as being unpatentable over Glover in view of U.S. Patent No. 4,357,497 to Hochmair et al. (Hochmair), contending Hochmair discloses an implantable device with multiple transmitters operating on different channels to transmit data to an external receiver. The Examiner concludes it would have been obvious to use such multiple transmitters operating at different channels of Hochmair in the Glover device to "simultaneously transmit data with different information from different areas."

Applicant observes that Hochmair discloses an apparatus that includes a passive stimulator for neuronal/ muscle stimulation and a transmitter for pre-processing and sending

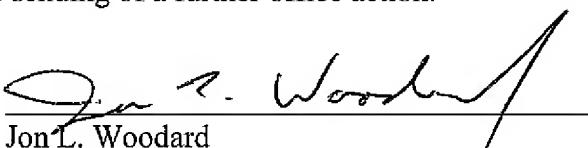
data. At least the stimulator with the stimulation electrodes is implanted below the skin. An information transmitter system is described in which information is transmitted from the (external) transmitter to the implanted stimulator. In operation, the transmitter sends information via multiple independent RF channels. Transmitters using amplitude modulation (with an optional non-linear mapping between the stimulation signal and the transmitted signal), inductive and magnetic coupling, pulse-type (digital) and analogue coding schemas between sender and receiver are discussed. Thus, Hochmair describes a type of multi-channel energy transformer where one side ends at the electrodes in the tissue or cochlear.

It is notable that the Hochmair stimulator implant is completely passive. See Hochmair at col. 13, lines 51-52. Applicant is unaware of any disclosure in Hochmair suggesting means for identification of the disclosed implant or an ability for measurement of electrical tissue/neuronal activity. Applicant is similarly unaware of any ability by the Hochmair device to transmit non-measured data from the implant externally (i.e. to the outside world). Thus, Hochmair and Glover do not, whether considered alone or in combination, appear to suggest sufficient technical basis for the combined elements of claims 1 and 9.

Applicant again notes that the Hochmair disclosure was among the items discussed with the Examiner during the October 25 & 26, 2010 telephone interviews with applicant's attorney. Given that claim 9 is dependent on claim 1, and since claim 1 itself is not currently under a § 103(a) rejection, applicant further refers to the current amendments to claim 1 in the above Listing of Claims in further response to the current § 103 rejection of claim 1.

**CONCLUSION**

As applicant believes the currently pending claims are now in a condition for allowance, it is respectfully requested that claims 1-9 be allowed for issuance and a Notice of Allowance sent. Should the Examiner determine there are any remaining matters that need to be addressed prior to allowance, the courtesy of a phone call to applicant's attorney, Jon L. Woodard, at 814-870-7664 is requested prior to the sending of a further office action.



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Date: October 27, 2010



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